

Factors Affecting Trial of Labour after Caesarean (TOLAC) Among Women with No Prior Vaginal Delivery

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Objective

This study aims to assess factors affecting the delivery outcomes for trial of labour after Caesarean (TOLAC) among women with no prior vaginal delivery.

Methods

Data for this retrospective study was obtained from the National Obstetrics Registry, Malaysia. A total of 260,959 deliveries from 14 tertiary hospitals were recorded from January 2011 to December 2012 out of which, 15, 749 were included in the study.

Study population include those with singleton and twin pregnancies, with 1 previous Caesarean section (CS) without prior vaginal birth. Exclusion criteria include those undergoing elective and emergency CS with documented contraindication for trial of labour.

The sociodemographic data, obstetric characteristics, labour induction and delivery outcomes were analyzed. Statistical analysis was done using chi square test, independent t-test and Mann-Whitney U test to compare variables. Odds Ratio (OR) with 95% confidence interval (95% CI) were calculated using multivariate analysis whereby P < 0.05 was considered as statistically significant.

Results

From the study group, 9963 (63.3%) had successful TOLAC resulting in vaginal birth after delivery (VBAC). Age and ethnicity distributions between both groups were similar. (Table 1)

Women with repeat CS had higher BMI. Higher repeat CS were seen among women with hypertension. In contrast, higher VBAC were seen among those with diabetes mellitus and heart disease.

Singleton pregnancy had higher VBAC rate as compared to multiple pregnancy. However, there were higher rate of VBAC regardless of the gestational age at delivery and method for induction of labour. (Table 2)

Multivariate analysis showed significant contributions to higher repeat CS with increasing BMI, presence of hypertension, diabetes mellitus, delivery at less than 37 weeks or more than 40 weeks, twin pregnancies, oxytocin-induced and prostaglandins-induced labour whereas increasing age, spontaneous labour and ARM-induced labour contributed to lower rate of repeat caesarean. (Table 3)

Table 1: Sociodemographic data

Sociodemographic data	Total N (%)	VBAC N (%)	Repeat CS N (%)
Age	30.6 (4.9)*	30.5 (4.9)*	30.6 (4.8)*
Ethnicity			
Malay	11989 (76.1)	7675 (77.0)	4314 (74.6)
Chinese	959 (6.1)	627 (6.3)	332 (5.7)
Indian	1082 (6.9)	526 (5.3)	556 (9.6)
Kadazan / Dusun	141 (0.9)	123 (1.2)	18 (0.3)
Bajau / Murut	109 (0.7)	92 (0.9)	17 (0.3)
Iban / Melanau	188 (1.2)	118 (1.2)	70 (1.2)
Bidayuh	144 (0.9)	84 (0.8)	60 (1.0)
Orang Asli (Peninsular Malaysia)	116 (0.7)	62 (0.6)	54 (0.9)
Other Sabah & Sarawak indigenous group	86 (0.5)	74 (0.7)	12 (0.2)
Foreigner	813 (5.2)	498 (5.0)	315 (5.4)
Others	95 (0.6)	62 (0.6)	33 (0.6)

* Mean (SD)

Table 2: Maternal Characteristic and Obstetric Factor

Maternal characteristic	VBAC	Repeat CS	P value ^e
	N (%)	N (%)	
Age	30.5 (4.9) ^a	30.6 (4.8) ^a	0.651 ^d
BMI (kg/m ²)	25.6 (7.0) ^b	27.5 (8.1) ^b	<0.001 ^e
Maternal co-morbidities			
Hypertension	477 (42.9)	635 (57.1)	<0.001
Diabetes mellitus	1140 (53.2)	1001 (46.8)	<0.001
Heart disease	88 (72.7)	33 (27.3)	0.030
Obstetric factor			
Number of fetus			<0.001
Singleton	9930 (63.5)	5720 (36.5)	
Twin	33 (33.3)	66 (66.7)	
Gestation age at delivery			
Less than 37 weeks	904 (56.1)	708 (43.9)	<0.001
37 to 40 weeks	7092 (65.4)	3757 (34.6)	
More than 40 weeks	730 (51.4)	689 (48.6)	
Birth weight (gram)	3030 (540) ^b	3100 (670) ^b	<0.001 ^e
Induction of labour			
Nil (spontaneous labour)	9723 (70.4)	4086 (29.6)	<0.001
ARM	1407 (73.4)	510 (26.6)	<0.001
Oxytocin	571 (58.7)	402 (41.3)	0.002
Prostaglandins	325 (42.8)	435 (57.2)	<0.001
Mechanical	3 (37.5)	5 (62.5)	0.131

^a Mean (SD) ^b Median (IQR)
^c chi square test ^d independent t-test ^e Mann-Whitney U test

Table 3: TOLAC Outcome and its Associations

	Wald χ^2	df	P	OR	95.0% C.I	
					Lower	Upper
Age	5.9	1	0.015	0.990	0.982	0.998
BMI	28.1	1	<0.001	1.007	1.004	1.010
Co-morbidities						
Hypertension	88.6	1	<0.001	2.060	1.772	2.394
Diabetes mellitus	52.1	1	<0.001	1.508	1.349	1.686
Heart disease	0.948	1	0.330	0.800	0.511	1.253
Gestation age at delivery						
Less than 37 weeks	13.6	1	<0.001	1.292	1.128	1.480
37 to 40 weeks (ref)				1.000		
More than 40 weeks	89.7	1	<0.001	1.809	1.600	2.045
Birth weight	51.4	1	<0.001	1.000	1.000	1.000
Number of fetus						
Singleton (ref)						
Twin	36.9	1	<0.001	4.599	2.810	7.525
Induction of labour						
Nil (spontaneous labour)	1316.3	1	<0.000	0.051	0.043	0.060
ARM	31.456	1	<0.001	0.702	0.620	0.794
Oxytocin	57.801	1	<0.001	1.805	1.550	2.102
Prostaglandins	82.654	1	<0.001	2.184	1.845	2.584
Mechanical	0.003	1	0.954	1.050	0.201	5.473

Conclusions

Reported rates of successful TOLAC ranges from 60 to 82 percents with multiple factors affecting its outcome. Prior studies have shown that those with previous vaginal delivery have higher predilection for attempting TOLAC and it is the single strongest predictor for successful TOLAC.

Higher CS rate seen with increasing BMI, presence of maternal co-morbidities, gestation at less than 37 weeks or more than 40 weeks and labour induction seen in this study is comparable to other studies. These findings would allow clinicians to make a calculated and well counseled approach to offering VBAC.

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